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C-A OPERATIONS PROCEDURES MANUAL

9.1.12 Procedure For Review Of C-A Shielding Design

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Hand Processed Changes

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Collider-Accelerator Department Chairman Date

D. Beavis

9.1.12 Procedure for Review Of C-A Shielding Design

1. Purpose

1.1 To provide instructions for liaison physicists and C-A Radiation Safety Committee (RSC) members for the process for review of shielding design for C-A facilities. Examples of events which should institute a shielding design review are the following:

1.1.1 installation of a new experiment or beam line,

1.1.2 substantial increases in beam intensity in an existing beam line,

1.1.3 removal of a substantial amount of material which acts as shielding for either the main ring or an existing beam line. These examples are not meant to be exhaustive.

1.2 Shielding placed for dose reduction purposes in existing radiological areas does not require review, but notification must be made to the C-A RSC Chairman and the C-A ALARA Committee Chairman.

1.3 All shielding at C-A facilities is under the scope of this procedure except for task specific shielding which is installed on a temporary basis for work and is part of an ALARA or RWP review.

2. Responsibilities

The C-A RSC or assigned subcommittee is responsible to review shielding designs to assure that the design provides the required level of protection. Both the C-A RSC and the ESHQ Associate Chair are responsible for approving the shielding design.

3. Prerequisites

C-A RSC members, liaison physicists, and liaison engineers.

4. Precautions

Failure to carefully review the shielding design can result in the potential of unnecessary dose to personnel.

5. Procedures

5.1 If the liaison physicist or liaison engineer is modifying shielding which is for dose reduction purposes in an existing radiological area with an approved radiological configuration then:

5.1.1 The shielding may be modified without immediate review of the RSC or the ALARA Committee.

5.1.2 The liaison physicist or liaison engineer shall notify the RSC Chairman and the ALARA Committee chairman of the modifications.

5.1.3 The RSC chairman and the ALARA chairman will determine if additional reviews are required.

5.2 The liaison physicist will describe the radiation issues and protection methods to the C-A RSC in a written description.

5.3 The C-A RSC will review and make recommendations on the shielding design.

5.4 The C-A RSC will assign a subcommittee to review the final shielding design upon its completion.

5.4.1 The subcommittee for secondary beam shielding will consist of the liaison physicist, liaison engineer, and at least one member of the C-A RSC.

5.4.2 The subcommittee for primary beam shielding will consist of the liaison physicist, liaison engineer, and at least two members of the C-A RSC.

5.5 The liaison physicist will work with the liaison engineer to complete the shielding design.

5.6 The liaison physicist will present the shielding design to the sub-committee for review of a facility. The review shall establish that the shield meets the following goals:

5.6.1 Limit the annual site-boundary dose equivalent to 5 mrem.

5.6.2 Limit the annual on-site dose equivalent to inadvertently exposed people in non-C-A facilities to 25 mrem per person.

5.6.3 Limit the maximum accumulated dose equivalent to any area where access is not controlled to less than 20 mrem during a fault condition.

5.6.4 For continuously occupied locations the dose equivalent rate shall be as low as reasonably achievable (ALARA) but in no case shall the design allow greater than 0.5 mrem in 1 hour or 20 mrem in 1 week.

5.6.5 Dose equivalent rates where occupancy is not continuous shall be ALARA but in no case shall the design allow greater than 1 rem in 1 year for whole body radiation, or 3 rem in 1 year for the lens of the eye, or 10 rem in 1 year for any organ or tissue.

5.7 The subcommittee will recommend approval of the shielding design to the C-A RSC

Chairman in writing.

5.8 The C-A RSC, and the ESHQ Associate Chair must approve the shielding design. The record of approval can be part of RSC meeting minutes or a separate document signed by both the RSC Chair and the ESHQ Associate Chair and distributed to RSC members and the C-A Department Chairman.

5.9 The approved official shielding print will be assigned an identifying number and become a permanent record of the shielding for the area.

5.10 The C-A RSC Chair will file a copy of the Committee review and approval in the RSC files and provide the project engineer with a copy of the approval.

5.11 Radiation surveys and fault studies will be conducted to verify the adequacy of the shielding.

5.12 A member of the subcommittee will be assigned to review the fault study plan whenever possible.

6. Documentation

6.1 Written description submitted by the liaison physicist prior to the C-A RSC review.

6.2 The minutes of the C-A RSC meeting(s).

6.3 The shielding official print.

6.4 Shielding surveys conducted under the appropriate fault study procedure.

6.5 Subcommittee review and written approval.

7. References

None.

8. Attachments

None.